

Listing of the Claims:

The following is a complete listing of all the claims in the application, with an indication of the status of each:

1-11. Canceled

12. (Currently amended) A method for analyzing and adjusting a wireless communications network, comprising the steps of:

generating or using, with a computer or server, a computerized model of a wireless communications network within a physical space in which said wireless communications network is or will be deployed, said computerized model providing a site specific representation of one or more of a floor plan, building layout, terrain characteristics, or RF characteristics, said computerized model identifying locations within said physical space of one or more components used in said wireless communications network, said computerized model having modeled attributes for at least one each of said one or more components;

~~positioning data collection measurement devices within said physical space;~~

~~identifying locations within said computerized model which correspond to said measurement devices;~~

~~measuring field measurement~~ receiving, at said computer or server, measurement data with said from one or more data collection measurement devices collectors or agents located in said physical space, said one or more measurement collectors or agents being the same or different from one or more of said one or more components used in said wireless communications network; and

predicting a , at said computer or server, one or more performance metrics metric for said wireless communications network, wherein predictions are made based on said field measurement data, said modeled attributes for said at least one of said one or more components, and said locations of said components within said computerized model measurement data from said one or more measurement collectors or agents; and

changing settings or configurations of at least one component of said wireless communications network based on instructions sent from said computer

or server.

13. (Currently amended) The method of claim 12 wherein said site specific representation ~~computerized model~~ is three dimensional.

14. (Currently amended) The method of claim 12 wherein said ~~data collection~~ measurement collectors or agents ~~devices used in said positioning step~~ are portable or fixed.

15. (Currently amended) The method of claim 12 further comprising ~~wherein said positioning step includes of~~ the step of affixing said ~~data collection~~ measurement devices collectors or agents permanently within said physical space.

16. (Original) The method of claim 12 wherein said performance metric predicted in said predicting step is selected from the group consisting of throughput, error rates, packet latency, packet jitter, symbol jitter, quality of service, security, coverage area, bandwidth, bit error rate, packet error rate, frame error rate, dropped packet rate, queuing delay, round trip time, capacity, signal level, interference level, bandwidth delay product, handoff delay time, signal-to-interface ratio, signal-to-noise ratio, physical equipment price, and cost information.

17.(currently amended) The method of claim 12 wherein said measurement data received in said receiving step ~~of measuring is performed~~ obtained manually.

18. (Currently amended) The method of claim 12 wherein said measurement data received in said receiving step ~~of measuring is performed~~ obtained autonomously.

19. (Currently amended) The method of claim 12 further comprising the step of storing said ~~field~~ measurement data.

20. (Currently amended) The method of claim 12 further comprising the step of updating said computerized model ~~generated in said generating step~~.

21. (Original) The method of claim 20 wherein said step of updating includes the steps of:

specifying components from a plurality of different modeled components which are to be used in said communications network, said modeled components including descriptions and attributes of a specific component; and

specifying locations within said physical space for a plurality of different components in said computerized model.

22. (Original) The method of claim 21 wherein said step of updating further includes the step of specifying an orientation for at least one component specified in said first specifying step at said location specified in said second specifying step.

23. (Currently amended) The method of claim 12 wherein said computerized model ~~in said generating step~~ identifies orientations of said components at said locations within said physical space and said predicting step utilizes said orientations.

24. (Currently amended) The method of claim 12 wherein said computerized model ~~generated in said generating step~~ includes one or more objects which create noise or interference, said noise or interference being an attribute of said one or more objects ~~object~~ which ~~are~~ is factored in said predicting step.

25. (Currently amended) The method of claim 12 wherein said one or more performance metrics ~~metric~~ predicted in said predicting step ~~are~~ is predicted in a forward direction in said wireless communication network.

26. (Currently amended) The method of claim 12 wherein said one or more performance metrics ~~metric~~ predicted in said predicting step ~~are~~ is predicted in a reverse direction in said wireless communication network.

27. (Currently amended) The method of claim 12 further comprising the step of specifying data transfer protocol, and wherein said predicting step uses a specified

data transfer protocol as a factor in predicting said one or more performance metrics metric.

28. (Currently amended) The method of claim 12 further comprising the step of specifying a network loading for said wireless communications network, and wherein said predicting step uses a specified network loading in predicting said one or more performance metrics metric.

29. (Currently amended) A system or apparatus for analyzing and adjusting a wireless communications network, comprising:

a computer or server for generating or using a computerized model of which shows a wireless communications network positioned within a physical space in which said communications network is or will be deployed, said computerized model providing a site specific representation of one or more of a floor plan, building layout, terrain characteristics, or RF characteristics, said computerized model identifying locations within said physical space of one or more components used in said wireless communications network, said computerized model having modeled attributes for at least one each of said one or more components;

data collection one or more measurement collectors or agents devices positioned operating or operational within said physical space which send measurement data to said computer or server, ~~said data collection measurement devices being represented within said computerized model at locations that correspond to said data collection measurement devices, said data collection measurement devices measuring field measurement data for said physical space;~~ and

~~means for~~ said computer or server predicting one or more a performance metrics metric for said wireless communications network based on said ~~field~~ measurement data; and said modeled attributes for said at least one of said one or more components, and said locations of said components within said computerized model, and said computer or server can send instructions to one or more components of said wireless communications network which cause settings or configurations of at least one component to be changed.

30. (Currently amended) The system or apparatus of claim 29 wherein said site specific representation ~~computerized model~~ is three dimensional.
31. (Currently amended) The system or apparatus of claim 29 wherein said ~~data collection~~-measurement collectors or agents ~~devices~~ are portable or fixed.
- 32 (currently amended). The system or apparatus of claim 29 wherein said ~~data collection~~-measurement collectors or agents ~~devices~~ are permanently affixed at ~~said locations~~ within said physical space.
33. (Currently amended) The system or apparatus of claim 29 wherein said performance metric predicted by said computer or server ~~means for predicting~~ is selected from the group consisting of throughput, error rates, packet latency, packet jitter, symbol jitter, quality of service, security, coverage area, bandwidth, bit error rate, packet error rate, frame error rate, dropped packet rate, queuing delay, round trip time, capacity, signal level, interference level, bandwidth delay product, handoff delay time, signal-to-interface ratio, signal-to-noise ratio, physical equipment price, cost information.
34. (Currently amended) The system or apparatus of claim 29 further comprising a storage device ~~means~~ for storing said ~~field~~-measurement data.
35. (Currently amended) The system or apparatus of claim 29 wherein said computerized model is stored on at least one server, wherein said at least one server is the same or different from said computer or server.
36. (Currently amended) The system or apparatus of claim 35 wherein said computerized model is stored on a plurality of servers, and said plurality of servers can communicate with each other.
37. (Currently amended) The system or apparatus of claim 36 wherein said plurality of servers have a heirarchical relationship to one another ~~in said system~~.

38. (Currently amended) The system or apparatus of claim 35 further comprising at least one portable client device, said at least one portable client device can communicate with said at least one server.

39. (Currently amended) The system or apparatus of claim 37 wherein said system includes a plurality of portable client devices.

40-56. Canceled

57. (Currently amended) A method for analyzing and adjusting a wireless communications network, comprising the steps of:

generating or using, with a computer or server, a computerized model of a wireless communications network within a physical space in which said communications network is ~~or will be~~ deployed, said computerized model providing a site specific representation of one or more of a floor plan, building model, terrain characteristics, or RF characteristics, said computerized model identifying locations within said physical space of one or more components used in said wireless communications network, said computerized model having modeled attributes for at least one each of said one or more components;

~~identifying locations within said computerized model which correspond to said measurement devices;~~

downloading or inputting files of ~~field~~ measurement data to said computer or server, where said measurement data is obtained from said physical space or from said wireless communications network; and

predicting or providing a one or more performance ~~metrics~~ metric for said wireless communications network based on said ~~field~~ measurement data; and said modeled attributes for said at least one of said one or more components; ~~and said locations of said components within said computerized model; and~~

changing settings or configurations of at least one component of said wireless communications network based on instructions sent from said computer or server.

58. (Currently amended) The method of claim 57 wherein said ~~field~~ measurement

data is obtained from measurement collectors or agents that are either portable or fixed ~~in said downloading or inputting step is specific for said physical space.~~

59-74. Canceled.

75. (Currently amended) A site specific method for analyzing and adjusting a communications network, comprising the steps of:

generating or using, with a computer or server, a computerized model of a communications network positioned within a physical space in which said communications network is or will be deployed, said computerized model providing a site specific representation of one or more of a floor plan, building layout, terrain characteristics or RF characteristics, said computerized model identifying locations within said physical space of one or more components used in said communications network, said computerized model having modeled attributes for at least one of each of said one or more components; said computerized model may contain objects which model objects within the physical space which may have attributes which impact performance of the communications network;

positioning data collection measurement devices within said physical space;

identifying locations within said computerized model which correspond to said measurement devices;

measuring field

receiving, at said computer or server, measurement data with said data from one or more collection measurement devices collectors or agents located in said physical space, said one or more measurement collectors or agents being the same or different from one or more of said one or more components used in said communications network; and

predicting, using said computer or server, one or more performance metrics for said communications network, wherein predictions are made based on said computerized model and said field measurement data; and said modeled attributes for at least one of said one or more components; said modeled attributes for said objects within the physical space, and said locations of said components

~~within said computerized model;~~ and
changing settings or configurations of at least one component of said communications network based on instructions sent from said computer or server.

76. (Currently amended) The method of claim 75 wherein said site specific representation ~~computerized model~~ is three dimensional.

77. (Currently amended) The method of claim 75 wherein said ~~data collection~~ measurement collectors or agents ~~devices used in said positioning step~~ are portable or fixed.

78. (Currently amended) The method of claim 75 further comprising the ~~wherein~~ said ~~positioning step includes the~~ step of affixing said ~~data collection~~ measurement collectors or agents ~~devices~~ permanently within said physical space.

79. (Original) The method of claim 75 wherein said one or more performance metrics predicted in said predicting step are selected from the group consisting of one or more performance metrics are selected from radio signal strength intensity, connectivity, network throughput, bit error rate, frame error rate, signal-to-interference ratio, signal-to-noise ratio, frame resolution per second, traffic, capacity, signal strength, throughput, error rates, packet latency, packet jitter, symbol jitter, quality of service, security, coverage area, bandwidth, server identification parameters, transmitter identification parameters, best server locations, transmitter location parameters, billing information, network performance parameters, C/I, C/N, body loss, height above floor, height above ground, noise figure, secure coverage locations, propagation loss factors, angle of arrival, multipath components, multipath parameters, antenna gains, noise level reflectivity, surface roughness, path loss models, attenuation factors, throughput performance metrics, packet error rate, round trip time, dropped packet rate, queuing delay, signal level, interference level, quality of service, bandwidth delay product, handoff delay time, signal loss, data loss, number of users serviced, user density, locations of adequate coverage, handoff locations or zones, locations of adequate throughput, E_c/I_o , system performance parameters, equipment price,

maintenance and cost information, user class or subclass, user type, position location, all in either absolute or relative terms.

80. (Currently amended) The method of claim 75 wherein said measurement data received in said receiving ~~said step of measuring is performed~~ is obtained manually.

81. (Currently amended) The method of claim 75 wherein said measurement data received in said receiving ~~said step is obtained~~ of measuring is performed autonomously.

82. (Currently amended) The method of claim 75 further comprising the step of storing said ~~field~~ measurement data.

83. (Currently amended) The method of claim 75 further comprising the step of updating said computerized model ~~generated in said generating step~~.

84. (Original) The method of claim 83 wherein said step of updating includes the steps of:

specifying components from a plurality of different modeled components which are to be used in said communications network, said modeled components including descriptions and attributes of a specific component; and

specifying locations within said space for a plurality of different components in said computerized model.

85. (Original) The method of claim 84 wherein said step of updating further includes the step of specifying an orientation for at least one component specified in said specifying components step at said location specified in said specifying locations step.

86. (Currently amended) The method of claim 75 wherein said computerized model ~~in said generating step~~ identifies orientations of one or more of said one or more components at said locations within said physical space and said predicting

step utilizes said orientations.

87. (Currently amended) The method of claim 75 wherein said computerized model ~~generated in said generating step~~ includes one or more objects which create noise or interference, said noise or interference being an attribute of said one or more objects ~~object~~ which are ~~is~~ factored in said predicting step.

88. (Currently amended) The method of claim 75 wherein said one or more performance metrics ~~metric~~ predicted in said predicting step are ~~is~~ predicted in a forward direction in said communication network.

89. (Currently amended) The method of claim 75 wherein said one or more performance metrics ~~metric~~ predicted in said predicting step are ~~is~~ predicted in a reverse direction in said communication network.

90. (Original) The method of claim 75 further comprising the step of specifying data transfer protocol, and wherein said predicting step uses a specified data transfer protocol as a factor in predicting said performance metric.

91. (Currently amended) The method of claim 75 further comprising the step of specifying a network loading for said communications network, and wherein said predicting step uses a specified network loading in predicting said one or more performance metrics ~~metric~~.

92. (Currently amended) A site specific system or apparatus for analyzing and adjusting a communications network, comprising:

a computer or server for generating or using a computerized model of ~~which represents and displays~~ a communications network positioned within a physical space ~~in which said communications network is or will be deployed~~, said computerized model providing a site specific representation of one or more of a floor plan, building layout, terrain characteristics, or RF characteristics, said computerized model identifying locations within said physical space of one or more components used in said communications network, said computerized model

having modeled attributes for at least one each of said one or more components; ~~said computerized model may contain objects which model objects within the physical space which may have attributes which impact performance of the communications network;~~

~~data collection one or more measurement collectors or agents devices~~ positioned within said physical space which obtain and send measurement data to said computer or server, ~~said data collection measurement devices being represented within said computerized model at locations that correspond to said data collection measurement devices, said data collection measurement devices measuring field measurement data for said physical space; and ———— prediction device for computer or server predicting one or more performance metrics for said communications network based on said computerized model and said field measurement data and, said modeled attributes for said at least one of said one or more components, said modeled attributes for said objects within the physical space, and said locations of said components within said computerized model, and said computer or server can send instructions to one or more components of said communications network which cause settings or configurations of at least one component to be changed.~~

93. (Currently amended) The system or apparatus of claim 92 wherein said site specific representation ~~computerized model~~ is three dimensional.

94. (Currently amended) The system or apparatus of claim 92 wherein said ~~data collection measurement~~ collectors or agents devices are portable or fixed.

95. (Currently amended) The system or apparatus of claim 92 wherein said ~~data collection measurement~~ collectors or agents devices are permanently affixed at said locations within said physical space.

96. (Currently amended) The system or apparatus of claim 92 wherein said one or more performance metrics selected from the group consisting of one or more performance metrics are selected from radio signal strength intensity, connectivity, network throughput, bit error rate, frame error rate, signal-to-interference ratio,

signal-to-noise ratio, frame resolution per second, traffic, capacity, signal strength, throughput, error rates, packet latency, packet jitter, symbol jitter, quality of service, security, coverage area, bandwidth, server identification parameters, transmitter identification parameters, best server locations, transmitter location parameters, billing information, network performance parameters, C/I, C/N, body loss, height above floor, height above ground, noise figure, secure coverage locations, propagation loss factors, angle of arrival, multipath components, multipath parameters, antenna gains, noise level reflectivity, surface roughness, path loss models, attenuation factors, throughput performance metrics, packet error rate, round trip time, dropped packet rate, queuing delay, signal level, interference level, quality of service, bandwidth delay product, handoff delay time, signal loss, data loss, number of users serviced, user density, locations of adequate coverage, handoff locations or zones, locations of adequate throughput, E_c/I_o , system performance parameters, equipment price, maintenance and cost information, user class or subclass, user type, position location, all in either absolute or relative terms.

97. (Currently amended) The system or apparatus of claim 92 further comprising a storage device for storing said ~~field~~ measurement data.

98. (Currently amended) The system or apparatus of claim 92 wherein said computerized model is stored on at least one server which may be the same or different from said computer or server.

99. (Currently amended) The system or apparatus of claim 98 wherein said computerized model is stored on a plurality of servers, wherein said plurality of servers can communicate with each other.

100. (Currently amended) The system or apparatus of claim 99 wherein said plurality of servers have a heirarchical relationship to one another ~~in said system~~.

101. (Currently amended) The system or apparatus of claim 98 further comprising at least one portable client device that can communicate with said at least one server.

102. (Currently amended) The system or apparatus of claim 100 wherein said system includes a plurality of portable client devices.

103-127. Canceled

128. (New) The method of claim 12 further comprising the step of storing or visualizing data representing comparisons of measurements with predictions.

129. (New) The method of claim 12 further comprising the step of storing or visualizing data representing either or both logical connections of network components or physical locations of network components.

130. (New) The system or apparatus of claim 29 further comprising a storage medium or display for, respectively, storing or visualizing data representing comparisons of measurements with predictions.

131. (New) The system or apparatus of claim 29 further comprising a storage medium or display for, respectively, storing or visualizing either or both logical connections of network components or physical locations of network components.

132. (New) The method of claim 57 further comprising the step of storing or visualizing data representing comparisons of measurements with predictions.

133. (New) The method of claim 57 further comprising the step of storing or visualizing data representing either or both logical connections of network components or physical locations of network components.

134. (New) The method of claim 75 further comprising the step of storing or visualizing data representing comparisons of measurements with predictions.

135. (New) The method of claim 75 further comprising the step of storing or visualizing data representing either or both logical connections of network components or physical locations of network components.

136. (New) The system or apparatus of claim 92 further comprising a storage medium or display for, respectively, storing or visualizing data representing comparisons of measurements with predictions.

137. (New) The system or apparatus of claim 92 further comprising a storage medium or display for, respectively, storing or visualizing either or both logical connections of network components or physical locations of network components.